

REMARKS

Claims 1-19, and 27 are pending. Applicants respectfully request the Examiner to fully consider the remarks that follow.

In the Office Action, claims 13, 14, and 16 were rejected under 35 U.S.C. § 102(b) as being anticipated by Ono et al. Applicants respectfully traverse this rejection.

Independent claim 13 is directed to a flexure and includes, for example, a first strip of material and a second strip of material, and the first and second strips of material have a width that is at least twice its thickness. Ono et al. does not disclose or teach a flexure that comprises strips of material. The elastic member 17 of Ono et al., as shown in FIG. 8, comprises a flat disk portion 17₀, an annular ridge 17₁, and a skirt portion 17₂, and has a central opening 17A. (Ono et al., col. 9, lns. 14-32). Thus, the elastic element 17 as described in Ono et al. is not a strip of material nor does it comprise strips of material.

Moreover, Applicants respectfully submit that Ono et al. does not disclose or teach the first and second strips of material having a width that is at least twice its thickness. In the Office Action, the Examiner points to Figure 8 as disclosing this feature. However, MPEP Section 2125 clearly states that “proportions of features in a drawing are not evidence of actual proportions when the drawings are not to scale.” Nowhere does Ono et al. indicate that Figure 8 is drawn to scale.

Accordingly, Applicants submit that claim 13, and the claims that depend from claim 13, namely claims 14-19, are patentable over Ono et al. and respectfully request that the rejection be withdrawn.

In the Office Action, claims 1, 2 and 4-12, 15, 17-19, and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ono et al. (U.S. Patent No. 5,555,004) in view of Armstrong (U.S. Patent No. 6,285,356). Applicants respectfully traverse this rejection.

Independent claim 1 and the claims that depend from claim 1, namely claims 2-12, are patentably distinguishable from Ono et al. in view of Armstrong because the claims are directed to a force sensor measuring applied forces that includes, for example, a flexure that supports the first member with respect to the second member and allows the first member to move relative to the second member substantially along two axes, and a readout mechanism that measures the displacement of the first member relative to the second member substantially along each of the two axes, wherein the applied forces are determined from the displacement of the first member relative to the second member. As conceded by the Examiner, Ono et al. fails to teach a readout mechanism measuring the displacement of the

first member relative to the second member substantially along each of the two axes, wherein the applied forces are determined from the displacement of the first member relative to the second member. (Office Action at page 3, lines 16-19.)

Armstrong does not make up for – at least - this deficiency. The sensors (42) of Armstrong directly measure force. They do not measure the displacement of a first member relative to a second member substantially along each of the two axes. Because the applied forces may be directly measured, there is no need to determine them from the displacement of a first member relative to a second member. The Examiner states “It would have been obvious to one skilled in the art at the time that the invention was made to have placed the sensors of Armstrong in the control device of Ono et al. for the purpose of detecting the applied force in the joystick so that the amount of movement is known.” (Office Action at page 3, line 21 – page 4, line 2.) Applicants respectfully submit that such a combination of Armstrong and Ono et al. would not have suggested the features that are claimed in claim 1 at the time that the invention was made because Armstrong measures the force directly with the force sensor. There is absolutely no need to measure the displacement of a first member relative to a second member.

Accordingly, Applicants submit that claim 1 and the claims that depend from claim 1, namely claims 2-12, are patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Moreover, many of the claims that depend from claim 1 are patentable over Ono et al. in view of Armstrong for additional reasons. For example, claim 4 depends from claim 1 and adds the feature that the readout mechanism comprises an inductive readout device. As conceded by the Examiner, “Ono et al. fails to teach the readout mechanism comprising an inductive readout device.” (Office Action, page 4, lines 5-6.) The Examiner instead points to the compression sensitive sensors (42) of Armstrong. However, the compression sensitive sensors (42) of Armstrong are not inductive nor do they measure the displacement of the first member relative to the second member. Armstrong describes the sensors 42 as including a pair of proximal circuit elements 40 and an associated compression-sensitive variable-conductance (CSVC) 36. (Armstrong at col. 9, lns. 55-57.) The proximal circuit elements 40 are described as being electrical conductors of an open circuit and the CSVC material 36 is “positioned to span across the opening of the element pair 40 and close the circuit in a variable electrical manner since the CSVC material 36 is variably conductive depending upon the magnitude or amount of compressive force applied to the material 36.” (Armstrong at

col. 9, lns. 27-37.) In contrast, Applicants direct the Examiner's attention to the specification at page 29, lines 1-6 in which Applicants explain how the inductive readout device of claim 4 operates. Accordingly, Applicants submit that for at least this additional reason, claim 4 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Claim 7 depends from claim 1 and adds the feature of a printed circuit board comprising the readout mechanism. The printed circuit board reads the relative displacement of the two members along each of the two axes. Ono et al. does not teach such a feature. The printed circuit board of Ono et al. is arranged to determine what direction the control element has been operated and a processor generates a velocity signal V that is used to move a cursor in that direction. (Ono et al. at col. 5, ln. 47 – col. 6, ln. 14.) The printed circuit board of Ono et al. does not read the relative displacement of the two members along each of the two axes such that the applied forces may be determined, as required by claim 7. Accordingly, Applicants submit that for at least this additional reason, claim 7 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Claim 8 depends from claim 1 and adds the feature of the flexure comprising a plurality of strips of materials of substantially equal dimensions, wherein the strips of materials are adapted to connect to each other to form the flexure. Ono et al. does not teach a plurality of strips of material of substantially equal dimensions. In the Office Action, the Examiner recites elements 17 and 17(2) of Ono et al. as being the strips of material. However, Ono et al. clearly defines element 17 as being an elastic member and element 17₂ as being a portion of element 17. Thus, elements 17 and 17₂ cannot be of substantially equal dimensions. Moreover, no portions of element 17 can be of substantially equal dimensions due to the annular shape of element 17. Accordingly, Applicants submit that for at least this additional reason, claim 8 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Claim 9 depends from claim 8 and adds the feature that the strips of material have an aspect ratio of approximately 30:1. In the Office Action, the Examiner conceded that Ono et al. fails to teach the width of the first strip of material is approximately 30 times the thickness of the first strip of material. (Office Action at page 4, lines 20-21.) Applicants submit that there is absolutely no motivation for one skilled in the art to have modified the size of the elastic member 17 of Ono et al. to have a width that is 30 times the thickness. Moreover, Applicants submit that such a modification would not have involved a mere change in the

size of the component for the purpose of fitting the strip material in and about the first and second members. Because the elastic member 17 of Ono et al. supports the weight of the control key 21, the thickness of the elastic member 17 must exceed a critical thickness. To then change the width of the elastic member 17 (Applicants note that the Examiner has failed to define what she considers the width to be) to be 30 times the critical thickness may not provide a device of the dimension desirable to one skilled in the art. In other words, such a modification does not involve a “mere change” in size. Accordingly, Applicants submit that claim 9 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Claim 10 depends from claim 8 and adds the feature that the strips of material are formed in an L-shape. In the Office Action, the Examiner conceded that Ono et al. fails to teach that the strips of material are formed into L-shaped. (Office Action at page 4, lines 20-21.) Applicants respectfully submit that Armstrong also fails to teach such features. The Examiner asserts that it would have been obvious to one skilled in the art to modify the shape of the component because it only involves routine skill in the art. (Office Action at page 5, lines 1-5.) First, Applicants respectfully submit that there would have been absolutely no motivation to modify the shape of the elastic member 17 to such a shape. The elastic member 17 of Ono et al. necessarily has to be annular because of the design of the control key 21. Forming elastic member 17, or any of its portions, into L-shaped strips of material makes no sense whatsoever. Second, Applicants respectfully direct the Examiner’s attention to the specification starting at page 15, line 19. Applicants have determined that forming the first and second strips of material into L-shaped strips of material is significant to the overall compliance of the flexure, and respectfully submit that Applicants’ work was not “routine skill in the art.” Accordingly, Applicants submit that for at least this additional reason, claim 10 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Claim 12 depends from claim 1 and adds the feature that the material comprising the flexure comprises a spring steel. As was brought to the Examiner’s attention in the last response, “spring steel” is an example of a high tensile strength steel, as disclosed in Applicants specification on page 20, lines 8-9. A spring is not necessarily made from “spring steel” material and components made from “spring steel” are not necessarily springs. Accordingly, Applicants submit that claim 12 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Claims 15, and 17-19 depend from independent claim 13. As discussed above, claim 13 is patentable over Ono et al. and is directed to a flexure capable of complying with applied forces and includes, for example, a first strip of material and a second strip of material, wherein the first strip of material is adapted to connect to the second strip of material to form the flexure element, and the first and second strips of material have a width that is at least twice its thickness.

Claim 15 adds the feature that the first and second strips of material are formed into L-shaped strips of material. In the Office Action, the Examiner conceded that “Ono et al. fails to explicitly teach that the first and second strips of material are formed into L-shaped strips of material.” (Office Action at page 5, lines 13-14.) Applicants respectfully submit that Armstrong also fails to teach such features. The Examiner asserts that it would have been obvious to one skilled in the art to modify the shape of the component because it only involves routine skill in the art. (Office Action at page 5, lines 15-18.) As stated above, Applicants respectfully submit that there would have been absolutely no motivation to modify the shape of the elastic member 17 to such a shape. The elastic member 17 of Ono et al. necessarily has to be annular because of the design of the control key 21. Forming elastic member 17, or any of its portions, into L-shaped strips of material makes no sense whatsoever. Second, Applicants respectfully direct the Examiner’s attention to the specification starting at page 15, line 19. Applicants have determined that forming the first and second strips of material into L-shaped strips of material is significant to the overall compliance of the flexure, and respectfully submit that Applicants’ work was not “routine skill in the art.” Accordingly, Applicants submit that for at least this additional reason, claim 15 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Claim 17 adds the feature that the strips of material comprise spring steel. As was explained above, “spring steel” is an example of a high tensile strength steel, as disclosed in Applicants specification on page 20, lines 8-9. A spring is not necessarily made from “spring steel” material and components made from “spring steel” are not necessarily springs. Accordingly, Applicants submit that claim 17 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Claim 19 adds the feature that the width of the first strip of material is approximately 30 times the thickness of the first strip of material. In the Office Action, the Examiner conceded that Ono et al. fails to teach the width of the first strip of material is approximately

30 times the thickness of the first strip of material. As explained above with reference to claim 9, Applicants submit that there is absolutely no motivation for one skilled in the art to have modified the size of the elastic member 17 of Ono et al. to have a width that is 30 times the thickness. Moreover, Applicants submit that such a modification would not have involved a mere change in the size of the component for the purpose of fitting the strip material in and about the first and second members. Because the elastic member 17 of Ono et al. supports the weight of the control key 21, the thickness of the elastic member 17 must exceed a critical thickness. To then change the width of the elastic member 17 (Applicants note that the Examiner has failed to define what she considers the width to be) to be 30 times the critical thickness may not provide a device of the dimension desirable to one skilled in the art. In other words, such a modification does not involve a “mere change” in size. Accordingly, Applicants submit that claim 19 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

Independent claim 27 is patentably distinguishable from Ono et al. in view of Armstrong because it is directed to a force sensor measuring applied forces that includes, for example, a first member comprising a handle having a longitudinal axis disposed in a predetermined first position, and the handle is movable substantially along two axes so as to displace the handle such that the longitudinal axis is spaced from and substantially parallel to the first position. Both Ono et al. and Armstrong disclose handles that have longitudinal axes that tilt or rotate such that their longitudinal axes are not spaced from and substantially parallel to a first position when they are moved. Accordingly, Applicants submit that claim 27 is patentable over Ono et al. in view of Armstrong and respectfully request that the rejection be withdrawn.

In the Office Action, claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ono et al. in view of Armstrong and further in view of Couch et al. (U.S. Patent No. 6,033,309). Applicants respectfully traverse this rejection.

Claim 3 depends from claim 1. As explained above, claim 1 is patentable over Ono et al. in view of Armstrong. Couch et al. does not make up for this deficiency because the device of Couch et al. does not measure the displacement of a first member relative to a second member substantially along two axes, such that the applied forces are determined from the displacement of the first member relative to the second member as required by claim 1. Instead, the LEDs (24a) and photo-detectors (24b) of Couch et al. measure the tilt of the joystick base 22 to determine the position of the joystick 14. (Couch et al. at col. 4, lns. 64-

67 and col. 6, lns. 4-9). Accordingly, Applicants submit that because claim 1 is patentable over Ono et al. in view of Armstrong and further in view of Couch et al., dependent claim 3 is also patentable over Ono et al. in view of Armstrong and further in view of Couch et al. and respectfully request that the rejection be withdrawn.

All rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

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Respectfully submitted,
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